

JUnit 4

JUnit

- JUnit is a java framework written by Erich Gamma and Kent Beck.
- It is used to implement unit tests in java.
- There are suitable frameworks for other programming languages such as C# (NUnit) , JavaScript (JSUnit) ...

JUnit 3.8 vs JUnit 4

JUnit 3.8	JUnit 4
naming conventions	annotation
GUI is available	omitted GUI

*The older version is still compatible in JUnit 4

JUnit 3.8

```
import junit.framework.TestCase;
public class TestGCD extends TestCase {

    GCD gcd = null;

    public void testGCD(){
        gcd = new GCD();
        assertEquals(5, gcd.getGCD(10,5));
    }
}
```

JUnit 4

```
import static org.junit.Assert.*;
import org.junit.Test;

public class TestGCD {

    GCD gcd = null;

    @Test
    public void CheckGCD(){
        gcd = new GCD();
        assertEquals(5, gcd.getGCD(10,5));
    }
}
```

Test Fixture

- Common set of objects want to be used in two or more test cases.
- Avoid duplicating the code
- Created and destroyed by `setUp()` and `tearDown()`

JUnit 3.8

```
public class testFixture extends TestCase{
    Calculate calculate = null;

    public void setUp() throws Exception {calculate = new Calculate();} 1 4
    public void tearDown() throws Exception {calculate = null;} 3 6
    public void testAdd() {assertEquals(30,calculate.Addition(10,20)); } 2
    public void testSub() {assertEquals(-10, calculate.Subtraction(10,20));} 5
}
```

JUnit 4

```
public class testFixture {  
    Calculate calculate = null;  
  
    @Before  
    public void initialize() throws Exception {calculate = new Calculate();}  
  
    @After  
    public void cleanObject() throws Exception {calculate = null;}  
  
    @Test  
    public void Add() {assertEquals(30,calculate.Addition(10,20));}  
  
    @Test  
    public void Sub() {assertEquals(10,calculate.Subtraction(10,20));}  
}
```

Testing Exceptions

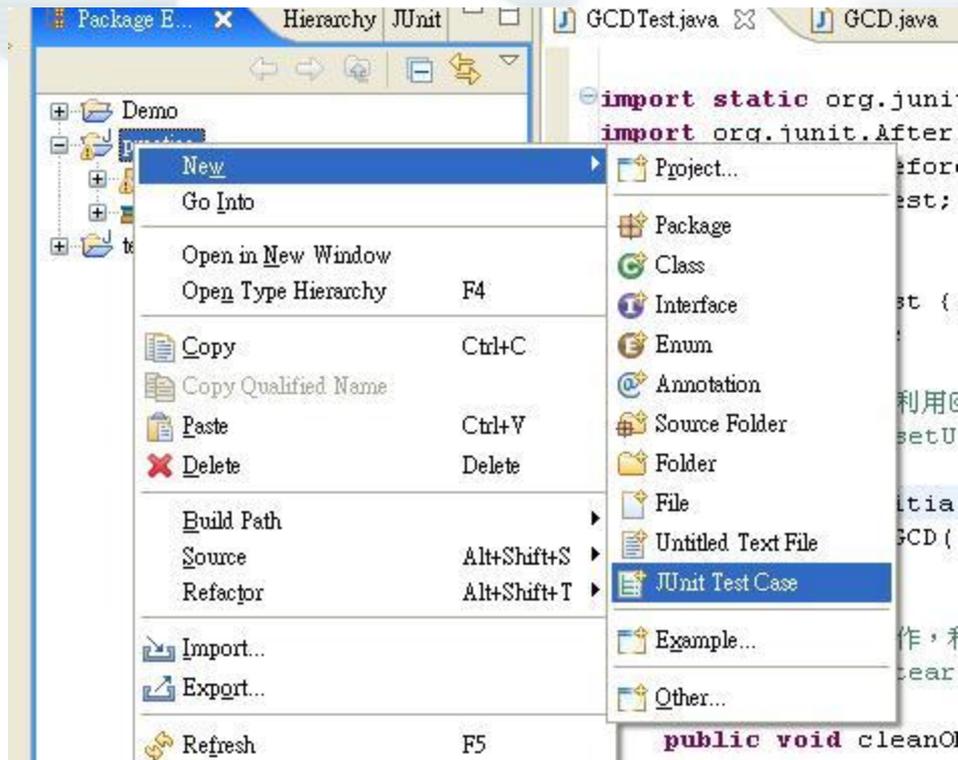
JUnit 3.8

```
public void testDivisionByZero() {  
    try {  
        calculate.division(1,0);  
        fail("Didn't catch the expected exception !");  
    }  
    catch (ArithmeticException success) {  
        assertNotNull(success.getMessage());  
    }  
}
```

JUnit 4

```
@Test(expected=ArithmeticException.class)  
public void testDivByZero(){  
    calculate.division(1,0);  
}
```

JUnit in Eclipse



JUnit in Eclipse(Cont.)

New JUnit Test Case

JUnit Test Case

Select the name of the new JUnit test case. You have the options to specify the class under test and on the next page, to select methods to be tested.

New JUnit 3.8.1 test New JUnit 4 test 選取JUnit版本

Source folder:

Package:

Name:

Superclass:

Which method stubs would you like to create?

setUpBeforeClass() tearDownAfterClass()
 setUp() tearDown()
 constructor

Do you want to add comments as configured in the [properties](#) of the current project?
 Generate comments 選取一開始要自動產生的method

Class under test:

JUnit in Eclipse(Cont.)

```
GCDTest.java x GCD.java
import static org.junit.Assert.*;
import org.junit.After;
import org.junit.Before;
import org.junit.Test;

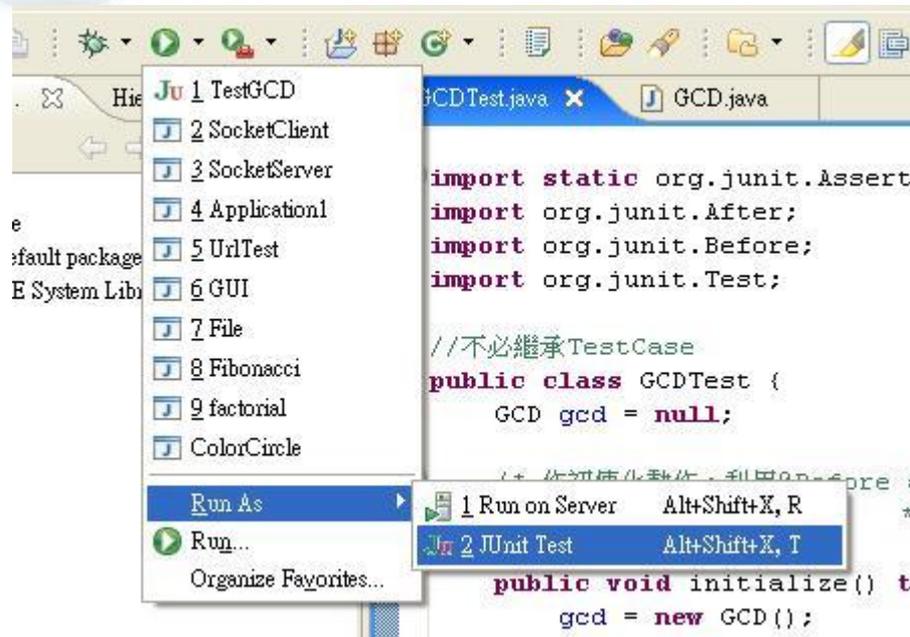
//不必繼承TestCase
public class GCDTest {
    GCD gcd = null;

    /* 作初使化動作，利用@Before annotation，method名稱可取自己想要的名稱，
       不用一定要取為setUp() */
    @Before
    public void initialize() throws Exception {
        gcd = new GCD();
    }

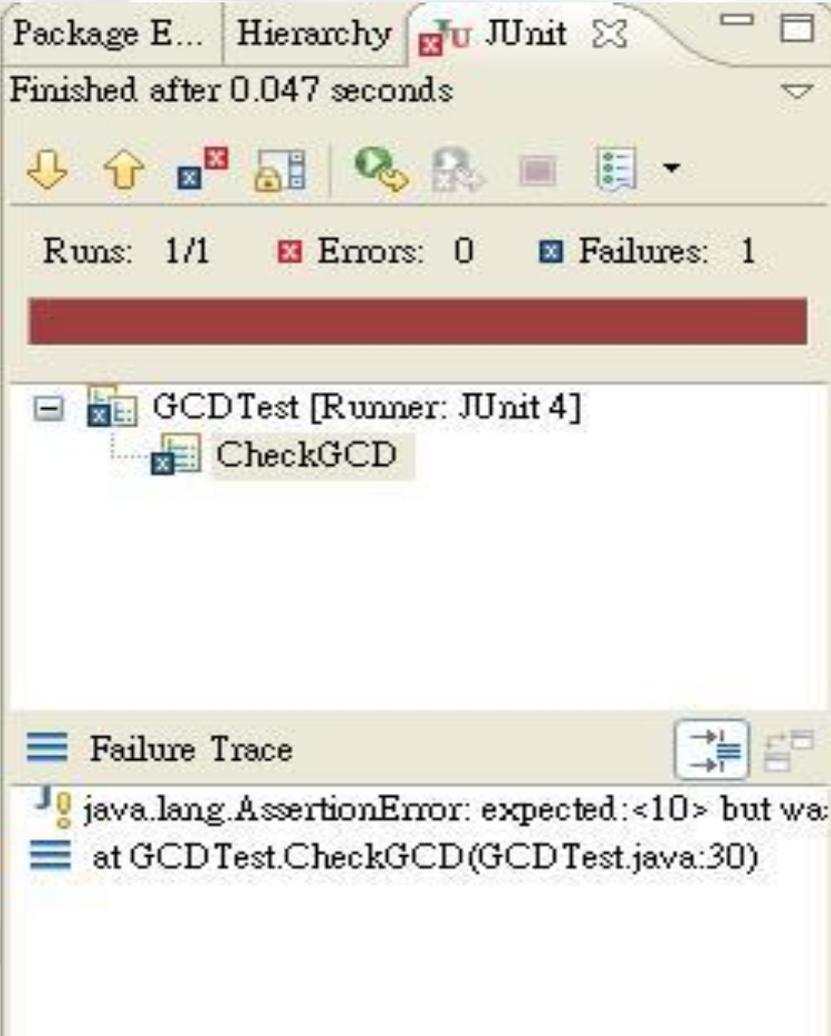
    /* 處理結束之後動作，利用 @After annotation，method名稱可取自己想要的名稱，
       不用一定要取為tearDown */
    @After
    public void cleanObject() throws Exception {
        gcd = null;
    }

    /* 測試的method，前面加上@Test annotation，method名稱可取自己想要的名稱，
       不必以test開頭 */
    @Test
    public void CheckGCD()
    {
        assertEquals(5, gcd.getGCD(10,5));
    }
}
```

JUnit in Eclipse(Cont.)



JUnit in Eclipse(Cont.)



The screenshot shows the Eclipse IDE's JUnit test runner window. The window title is "JUnit" and it displays "Finished after 0.047 seconds". The test results summary shows "Runs: 1/1", "Errors: 0", and "Failures: 1". A red progress bar indicates the test status. The test hierarchy shows "GCDTest [Runner: JUnit 4]" with a sub-test "CheckGCD" marked as failed. The "Failure Trace" section shows the error message: "java.lang.AssertionError: expected: <10> but wa:" followed by the stack trace "at GCDTest.CheckGCD(GCDTest.java:30)".

Package E... Hierarchy **JUnit**

Finished after 0.047 seconds

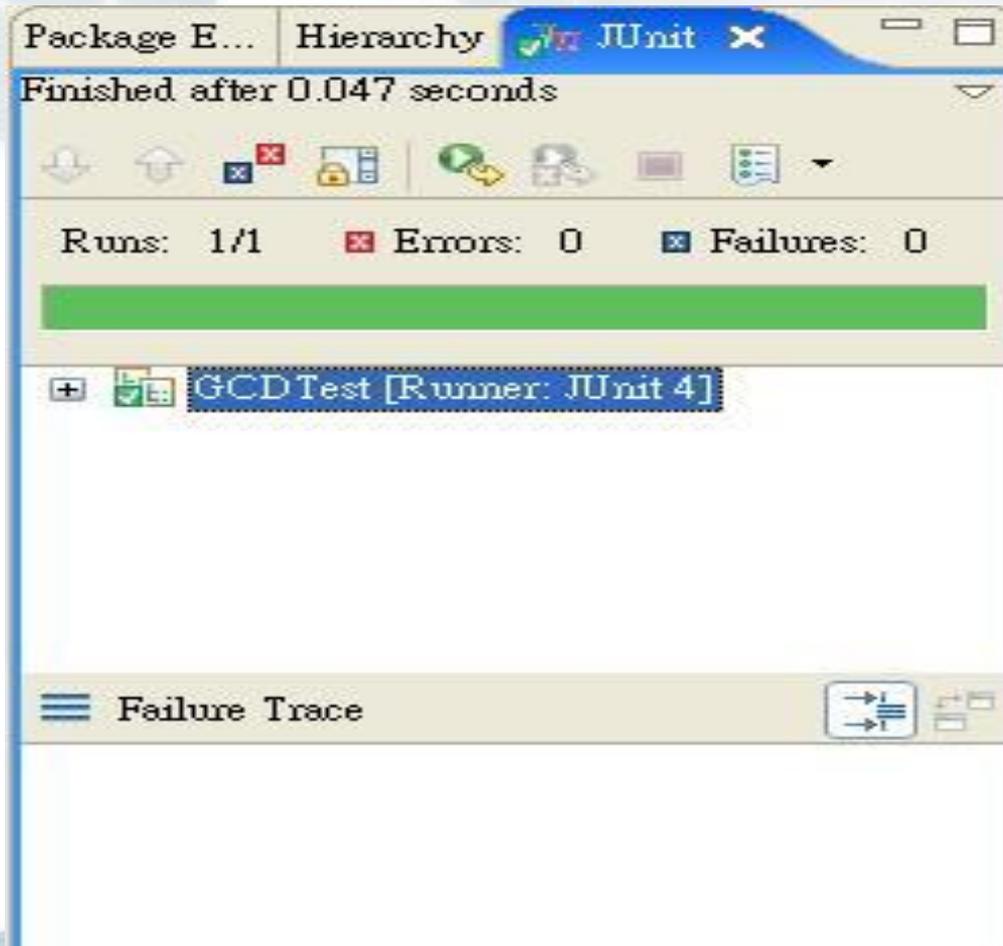
Runs: 1/1 **Errors: 0** **Failures: 1**

GCDTest [Runner: JUnit 4]
 CheckGCD

Failure Trace

```
java.lang.AssertionError: expected: <10> but wa:  
at GCDTest.CheckGCD(GCDTest.java:30)
```

JUnit in Eclipse(Cont.)



References

- http://junit.sourceforge.net/doc/faq/faq.htm#overview_1
- <http://www.ibm.com/developerworks/tw/library/j-junit4.html>
- <http://caterpillar.onlyfun.net/Gossip/JUnit/JUnitGossip.html>